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# The influence and mechanism of sports on children's cognitive ability

Weidong Sun,Jian Zhou
Chengdu sport institute

**Objective** Proper participation in physical exercise can not only benefit people physically, but also promote people's psychological benefits. However, people are often only aware of the benefits of physical exercise, such as physical fitness, body shape and function, and ignore the psychological benefits caused by physical exercise. In recent years, more and more people pay attention to the positive psychological benefits of physical exercise on cognition. As the hope of the future of the country, the problem of physical health is widely concerned. To study the effect of physical exercise on children's cognitive function, and to analyze the possible biological mechanism of physical exercise affecting cognitive ability, and to provide a reference for promoting the good development of children's physique.
**Methods** Through the retrieval of Chinese knowledge network, Wanfang Data knowledge service platform, VVP cube knowledge discovery system, 100 chain database collection sports related research literature, collating literature information, in-depth integration of literature, analysis of the impact and mechanism of physical exercise on children's cognition.
**Results** (1) Physical exercise can improve the function of the brain, improve the efficiency of the brain, and enhance memory. Animal experiments have shown that physical exercise can enhance short-term memory by improving hippocampal function in rats. (2) Regular physical exercise can improve children's memory and executive function, and promote their cognitive function and academic performance. (3) The effect of physical exercise on specific cognitive function is in turn motor function, motor skills, academic performance, reasoning, reaction time and executive function. Physical exercise promotes cognitive performance by improving the goal of the brain pointing to the maintenance of processing, but physical exercise does not improve or slow down processing inhibition, and physical exercise is not related to processing inhibition. 30 minutes of acute physical exercise plays a significant role in maintaining children's attention. Acute high intensity physical exercise can improve selective attention and short-term memory tasks. In the experiment of the effect of one-off acute physical exercise on cognitive function, moderate intensity of heart rate variables and increased cognitive performance were related. For children with attention deficit hyperactivity disorder, physical exercise can improve their performance of executive function. (4) Physical exercise may affect the possible biological mechanisms of cognitive function: Firstly, exercise can improve the synthesis and secretion of neurotransmitters such as acetylcholine and dopamine, activate conduction pathways, improve synaptic transmission efficiency, and promote the development of learning and memory function. Secondly, exercise can increase brain derived neurotrophic factor (BDN F), release of nerve growth factors such as insulin-like growth factor --1 (IGF--1) and so on, thus promoting the development of learning and memory function. Again, physical exercise may also improve learning and memory performance by affecting the release of glucocorticoids. Then, physical exercise can enhance the gene expression in the brain area related to learning and memory. Finally, physical exercise may maintain and improve cognitive ability by improving the antioxidant capacity of brain tissue.
**Conclusions** Physical exercise can promote the improvement of children's cognitive ability. The basic cognitive ability of children can be developed through physical exercise. The mechanism of the exercise can be explained by the changes of the brain nerve mechanism, such as increasing the brain

capacity and increasing the flow velocity of the brain. The specific biological mechanism still needs to be studied.